turing the tube. Finally, in a last manufacturing step, the externally threaded neck **2** with the shoulder **2***b* is produced by injection molding within the tool, wherein the tool also surrounds the tube body **1**, or at least its end **1'** provided with the connection to the shoulder **2***b*. Simultaneously with injection molding the plastic material to form the externally threaded neck **2** and the shoulder **2***b*, the material is welded to the material of the end **1'** of the tube body and forms a permanent welded connection making it one piece as a result.

For manufacturing a tube with a polygonal cross-section of the tube body and the adjacent end of the shoulder **2***b* in the form of a hexagon in accordance with the second embodiment of the invention shown in FIGS. **6–11**, the method according to the invention can be varied as follows.

The tube body **1** is extruded in its final cross-sectional shape which is particularly shown in the top view of FIG. **9**. Two longer sides **1"**, which can be imprinted later, are located opposite each other. Also forming part of the cross-section are two times two narrower side surfaces **1'"** which form the aforementioned hexagon together with the side surfaces **1"**. Subsequently, one or both side surfaces **1"** are imprinted, and the marking **18** is applied simultaneously. The tube body **1** is then placed in this final shape into the injection molding machine or the injection tool. In this case, it is not necessary to provide means for producing the hexagonal cross-section in the tool. The remaining manufacture and injection molding of the externally threaded neck **2** together with the shoulder **2***b* are carried out in the same manner as described above in connection with the manufacture of the tube body having the square cross-section.

Of course, the invention is not limited to tube bodies having the cross-sections described above. However, these cross-sections are particularly suitable with respect to their optically aesthetic configuration as well as the possibility of applying imprints.

As can be seen particularly in FIG. **12**, the shoulder **2***b* and the end **1'** of the tube body **1** overlap with their edges in the area **21**, wherein preferably the edge portion of the end **1'** of the tube body **1** engages from outside over the edge portion of the externally threaded neck **2**. Consequently, after the injection molding and welding procedure has been carried out, this end portion of the shoulder **2***b* is beveled at its inner side, i.e., the shoulder **2***b* becomes narrower toward its end. Since, in addition, the outer surfaces of the shoulder **2***b* and of the tube body **1**, **1'** rest against the inner wall of the injection mold **24**, only shown schematically in a dash-dot line, practically no sharp transition edge between the end **1'** of the tube body and the shoulder **2***b* can be seen from the outside. Consequently, the transitions from the surfaces of the shoulder to the surfaces of the tube body are virtually without edges and cannot be seen.

The welding procedure can be carried out, for example, in accordance with the heat impulse method. Any unevenness, such as material excess, occurring during the injection procedure can be eliminated, so that a smooth surface without edges or seams is produced. The tube body **1** and the externally threaded neck **2** with the shoulder **2***b* are manufactured with thermoplastic material, preferably polyethylene. Because of the required mechanical strength and in view of the use value of the plastic tube, the screw cap may be hard and manufactured of polyethylene. Since the plastic tube according to the invention is preferably used for packing expensive cosmetics, the optical properties of the thermoplastic material plays an important role. It is also important that the plastic tube maintains its shape, particularly with respect to the formation of scratches in the area of the shoulder **2***b*. The plastic tube according to the present invention meets these high requirements in a simple manner.

While specific embodiments of the invention have been shown and described in detail to illustrate the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

We claim:

1. A plastic tube comprising a tubular tube body having first and second ends, a neck having an external thread and a shoulder connecting the neck to the first end of the tube body, and a screw cap having an internal thread configured to be screwed onto the external thread of the neck, wherein the shoulder is a component injection molded onto the first end of the tube body, and wherein the shoulder and the neck are constructed in one piece, the shoulder and the first end of the tube body having a substantially polygonal cross-section, wherein the polygonal cross-section of the tube body extends from the first end of the tube body in the direction to the second end of the tube body, wherein the neck has a base area, the shoulder extending from the base area of the neck toward a transition point between the shoulder and the tube body in a conical shape or a convex shape, wherein an inner surface of the conical shape or a concave inner surface of the convex shape is directed toward the second end of the tube body, and wherein an outer surface of the conical shape or a convex outer surface constitute a guide surface and support surface for an edge of the cap and for supporting the cap on the shoulder in an end position of the cap in which the cap is fully screwed onto the neck, wherein the shoulder is rectangular or square, and a square or rectangular portion of the tube body is connected to the shoulder, wherein the shoulder of the neck is constructed such that the edge of the screw cap slides on the shoulder when the screw cap is screwed onto the neck, wherein the shoulder is of an elastic, flexible plastic material, so that a locking and snap-type connection between the screw cap and the neck is achieved only at an end of the screwing procedure after overcoming a frictional force, whereby a sealing contact of the screw cap with the neck is ensured in the end position, and wherein the screw cap comprises a top wall with a square or rectangular shape and a sleeve extending in a longitudinal direction from a bottom of the screw cap, the internal thread being formed in the sleeve, wherein the neck has at a transition point to the shoulder a circumferential bead, two diametrically oppositely located projections being mounted on the bead, the sleeve having an end face with diametrically oppositely located recesses, wherein the projections engage in the recesses for effecting the locking and snap-type connection.

2. The plastic tube according to claim **1**, wherein the internal thread is in the area of the recesses of an elastic plastic material, and wherein the projections each have a slanted surface, wherein the sleeve slides with an inner surface in the area of the recesses onto the slanted surfaces for unlocking.

3. The plastic tube according to claim **1**, wherein the shoulder is beveled toward a rim area thereof.

4. The plastic tube according to claim **1**, wherein the neck comprises an outlet opening for contents of the tube, and the cap comprises a pin capable of engaging in the outlet opening.

5. The plastic tube according to claim **1**, wherein the shoulder is convex.

6. The plastic tube according to claim **1**, wherein the end face of the sleeve has diametrically oppositely located